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Risk of Readmissions for Medical and Surgical Patients Who “Self-Discharge” Leaving Hospitals Against Medical Advice

Kedrick Leonardo Williams
Medical University of South Carolina

RISK OF READMISSIONS FOR MEDICAL AND SURGICAL PATIENTS WHO "SELF-DISCHARGE" LEAVING HOSPITALS AGAINST MEDICAL ADVICE

BY

Kedrick Leonardo Williams

A doctoral project submitted to the faculty of the Medical University of South Carolina
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"And we know all things work together for good to them that love God,
to them who are the called according to His purpose."—Romans 8:28 KJV

Abstract of Dissertation Presented to the
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Kedrick Leonardo Williams

Chairperson: Walter J. Jones, PhD

Committee: Kit N. Simpson, DrPH

Mary Dooley, PhD

Abstract

Research indicates that as hospital costs increase and Emergency Room wait times grow, more patients leave facilities against medical advice at the detriment to their medical condition and higher risk for mortality (Reese, 2019). Discharges against medical advice (DAMA), in which a patient chooses to leave the hospital without physician approval, is a growing problem for patients and providers (Taqueti, 2007; Carrese, 2006). Patients who DAMA only represent 1-2% of hospital admissions; however, this small group is quite significant due to their high readmission and mortality rates (Lee et al., 2016). It is therefore important to understand characteristics of these patients and challenges associated with their readmittance to improve patient outcomes and minimize economic burden on the U.S. healthcare system (Lee et al., 2016; Reese, 2019). This retrospective analytic study reviewed the risk of readmissions of DAMA patients by analyzing hospital billing data of patients across Florida, Georgia, Kentucky, and Mississippi. Descriptive statistics, demographic characteristics, and diagnosis related data yielded insight on the risk of readmissions and the impact DAMA has upon patients' health status upon being readmitted.

Dedication

Our deepest fear is not that we are inadequate.
Our deepest fear is that we are powerful beyond measure.
It is our light, not our darkness
That most frightens us.

We ask ourselves
Who am I to be brilliant, gorgeous, talented, fabulous?
Actually, who are you not to be?
You are a child of God.

Your playing small
Does not serve the world.
There's nothing enlightened about shrinking
So that other people won't feel insecure around you.

We are all meant to shine,
As children do.
We were born to make manifest
The glory of God that is within us.

It's not just in some of us;
It's in everyone.

And as we let our own light shine,
We unconsciously give other people permission to do the same.
As we're liberated from our own fear,
Our presence automatically liberates others.

--Marianne Williamson, A Return to Love

With all of this acknowledged, I dedicate this doctoral project journey and products to:

Thomas Williams, Sr, my paternal grandfather, my Superman, and Guardian Angel since September 14, 2020

Allen Williams, my paternal uncle, fond supporter and encourager, and Guardian Angel since November 30, 2020

Kennedi Mattlyn-Rose Williams, our firstborn child and precious Baby Girl who gave me the name, "Daddy" on July 19, 2021

The "Forgotten" Population*:* All patients across the states of Florida, Georgia, Kentucky, and Mississippi who have left and still leave hospitals against medical advice and feel that their voice is not heard; because of you, this research was made possible and shall change lives for years to come.

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1. Chapter I INTRODUCTION

1.1 Defining Self-discharges

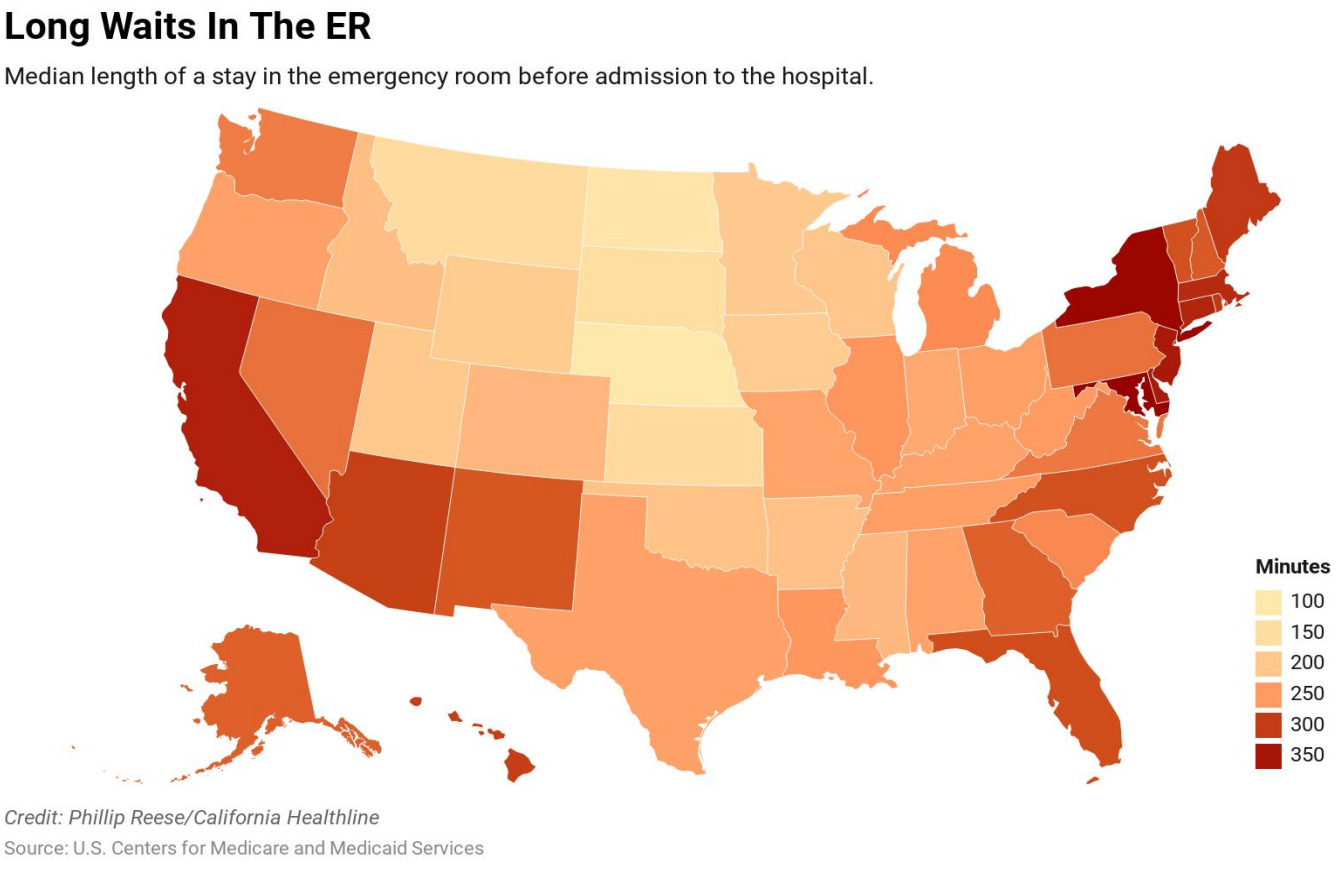
Research indicates that as Emergency Room (ER) wait times grow, more patients leave facilities against medical advice even at the detriment to their medical condition or overall health (Reese, 2019). ER wait times have been noted as getting longer and longer in time due to "overcrowding of patients"; patients with "increased number of ER trips"; and the realization that "emergency care doesn't equal fast care all of the time" (Reese, 2019). According to Reese (2019), the California Office of Statewide health Planning and Development describes patient ER encounters of leaving with the doctor's consent as when a patient leaves the ER after seeing a doctor but before the doctor clears them to leave. This is also widely known as leaving with the hospital or doctors' consent. Leaving with the doctors' consent includes when a doctor carefully explains the risks to the patient and has the patient sign a form of adherence, understanding, and compliance.

Discharge against medical advice (DAMA), in which a patient chooses to leave the hospital before the treating physician recommends discharge, is a growing problem for both patients and providers who treat hospitalized patients (Taqueti, 2007; Carrese, 2006). ER Medical Directors experience interactions with such patients more often than one can imagine. Dr. Steven Polevoi, medical director of the emergency department at UCSF Helen Diller Medical Center at Parnassus Heights, said "patients leaving the emergency room too soon are deliberately putting themselves at more risk for morbidity and even mortality" (Reese, 2019). Dr. Veronica Vasquez-Montez, emergency room medical director at Good Samaritan Hospital in Los Angeles, said "I sometimes have tough conversations with sick patients who are intent on leaving the ER . . . I have to give them pressing responsibilities" (Reese, 2019). "I simply tell them, "If you die from this, you are good to no one you are caring for" (Reese, 2019).

These are just a few real examples of interactions between providers and patients who elect to

choose to be non-compliant despite the severity of their health condition. Another ER Medical Director Dr. Jay Brenner said, “When someone requests to leave, it needs to be a priority [to get them to stay] that ranks just below a cardiac arrest” (Reese, 2019). Such a statement highlights the significance of serving all patients in these facilities, regardless of the patients’ intensity of health challenge, race or ethnicity and socioeconomic demographics. As displayed in Figure 1 below, the states with the longest median length of stay in ER prior to hospital admissions are states on the West Coast and East Coast of the United States. While research has not provided a theoretically-sound rationale for such a trend, it is certainly worth investigating for any correlation between patients, providers, and practices that may yield justification.

Figure 1. ER Wait Times—Nationwide Data (Reese, 2019)



1.2 Rationale for Patients who Self-discharge

Considering these statements from such experienced health care providers and hospital administrators, one might ask themselves, why would a patient leave the hospital AMA? Could it be lack of trust of healthcare providers, dissatisfaction of services provided, or even disagreement with recommended treatments in response to their conditions? All these factors could indeed contribute to patients leaving AMA and limited research supports these considerations.

Studies on patients leaving AMA have identified several reasons why patients make such decisions and follow-up with the action of leaving health care facilities. The reasons or factors mentioned above have indeed been identified in these studies. Albayati et al. (2021) retrospectively reviewed 49 articles and built upon a 2012 report by the Healthcare Cost and Utilization Project (H-CUP), which reported out that "lack of clinical improvement with previous treatments", "dissatisfaction with the hospital environment", "discontentment with the behavior of the medical staff", and "lack of coordination of care" are among several reasons why patients leave AMA. Another reason for DAMA is the dissatisfaction of patients with received care at the hospital. In a study conducted in Kuwait, the main cause for DAMA has been patients' dissatisfaction with the received care (El Malek et al, 2014). Dissatisfaction with the physician and the medical staff also has been stated as a cause of DAMA (Baptist et al., 2007). In addition, some patients have self-discharged in result of their disagreement with the prescribed medicines or treatments recommended by their physician. Appelbaum and Roth (1983) noted how "This study of the phenomenon of treatment refusal in medical and surgical settings has disclosed that refusal is a common occurrence . . . and were often precipitated by problems within the physician-patient relationship". "Predictors of AMA discharge, based primarily on retrospective cohort studies, tended to be younger age, Medicaid or no insurance, male sex, and current or a history of substance or alcohol abuse" (Alfandre, 2009). "Interventions to reduce the rate of DAMA have not been systematically studied" (Alfandre, 2009).

1.3 Impact of Self-discharges upon Patients and Providers

Upon patients making such a decision [to self-discharge], they are voluntarily signing themselves up for "increased readmission rates" (Glasgow et al., 2010) and "an expected increased risk of adverse [health] consequences and subsequent litigation" (Devitt et al., 2000). Consequently, leaving the hospital against the physician's advice may expose the patient to risk of an inadequately treated medical problem and result in the need for readmission (Hwang et al., 2003). Further research reports that "between 1% and 2% of all medical admissions result in an AMA discharge" (Alfandre, 2009). The results of a retrospective study, in which 181,516 admitted patients were studied for two years, showed that the risk of mortality and readmission of DAMA patients is 40% more than patients who complete their treatment period in the hospital (Fiscella et al., 2007).

For providers who are offering quality care to patients on an hourly basis in both emergency rooms and hospital departments, patients who leave AMA can be quite challenging and frustrating. This is the case when considering the legal implications that stem from patients who leave AMA. From the research completed in the Levy et. al study, "emergency physicians should make every attempt to prevent a patient from leaving AMA" (Ding et. al., 2007; Levy et. al., 2012). Yet, when this cannot be accomplished, there are "three requirements that should be met for the AMA process to confer optimal legal protection" (Levy et. al., 2012). "First, a patient should be deemed to have the capacity to refuse care" (Levy et. al., 2012). "Second, all potential risks should be disclosed" (Levy et. al., 2012). "Third, the AMA consent should be properly documented in the chart" (Levy et. al., 2012). One can only imagine the significant amount of time, energy, and resources needed to undergo this process in addition to the plethora of processes to be completed to provide quality care to all patients, who leave AMA or not.

2. Chapter II LITERATURE REVIEW

2.1 Project Objective

Although beyond the scope of this review, a much larger amount of literature has examined psychiatric inpatients and AMA discharges (Brook et al., 2006). Clinical overlap exists between medical and psychiatric patients studied because of the high burden of psychiatric morbidity in medical inpatients; however, data are otherwise too diverse to allow wide-ranging comparisons. For example, "AMA discharges in psychiatric populations range from 3% to 51% (average, 17%), far higher than in medical patients studied" (Brook et al., 2006). Yet, what are the characteristics of patients excluded from psychiatric populations and mental health diagnoses who leave hospitals against the medical advice and need for treatment obtained from health care providers? Also, what is the rate of early readmission (within 7 days) and later readmissions (within 30 days of discharge) for these patients who LAMA? Lastly, what contribution (or impact) does patients' decision to leave AMA have upon their health status upon being readmitted?

This study offered the opportunity to use prior studies as a foundation and rationale to press beyond the current and produce some new, fruitful findings for the benefit of health care providers and facilities who loose significantly due to patients leaving AMA. The two objectives of this study were to describe the characteristics of medical/surgical patients who leave AMA and examine the risk of a hospital readmission after leaving AMA. These objectives were accomplished by 1) searching the literature using key terms including "self-discharge"; "patients leaving AMA"; "against medical advice"; "DAMA"; "discharge against medical advice"; and "hospital patients DAMA"; 2) reviewing prior studies and in particular, surveying the results sections of studies to learn of the characteristics, demographics, and common health challenges of patients who leave AMA; 3) building and performing a methodology utilizing statistical tests completed in similar studies to analyze hospital

billing data to obtain the three areas of findings; and 4) producing a final product reporting the conclusions of characteristics and challenges noted from the results.

2.2 Project Significance and Statement of Need

The decision made by patients leaving AMA is one that has the power to produce an unwarranted chain of dependent and fatal health challenges for patients, cause financial distress to a health care facility, and/or develop career-altering changes within the lives of health care providers. Research showcases that "although DAMA cases account for only a small percentage of hospital discharges, they are important because DAMA patients have high readmission and mortality rates" (Lee et al., 2016). "It is therefore important to understand the general characteristics and predictors of DAMA in order to improve patient outcome and minimize the economic burden on the healthcare system" (Lee et al., 2016; Reese, 2019). Additionally, such an understanding could ultimately save countless lives lost from the decision and subsequent health consequences stemming from DAMA.

Against medical advice (AMA) discharges are an important, yet understudied, aspect of health care, particularly in trauma populations (Haines et. al., 2020). AMA discharges result in increased mortality, increased readmission rates, and higher health care costs (Haines et. al., 2020). Studies examining discharges AMA highlight how these consequences occur when patients chose to leave the hospital though treatments or additional care is recommended from healthcare providers. Berger (2008) and Farber et al (2006) both illuminate that when patients are considering discharge AMA, their healthcare team should "explain risks associated with a premature discharge and are obligated to obtain informed consent with regards to the risk disclosure". Research indicates that such a practice deems to be profitable to all parties involved: patient, provider, and payer; however, when this task is not properly carried out, it can lead to significant challenges (Marcoux et al., 2016). The way in which this point is strongly articulated in literature further indicates that interprofessional

medical teams may or may not be offering quality health services at the highest regard for their patients (Marcoux et al., 2016). If providers do not first comprehensively evaluate patients' ability to make informed decisions about their health and well-being, then providers should not offer for patients to sign a release from the facility (Berger, 2008; Marcoux et al., 2016).

Literature further mentions the failure to reach agreement on importance of continued care between the providers and patients. This challenge develops from a myriad of baseline characteristics including the patients' perspective of their healthcare needs; patients' literacy rate; patients' health insurance status; and even patients' preexisting health conditions (Baptist et al., 2007; Marcoux et al., 2016). Considering this, healthcare providers are often concerned that patients who are discharged AMA are at higher risk to expose themselves and possibly their caregivers to considerably serious health consequences (Hwang et al., 2003; Baptist et al., 2007; Marcoux et al, 2016).

2.3 Approach by Marcoux et al. Study

According to the literature, researchers have approached the issue of discharge AMA with several studies. One retrospective study was conducted by Marcoux et al. (2016) who followed-up with 106 patients who had traumatic brain injuries. Marcoux et al. (2016) built a study to examine the characteristics of patients who left hospitals AMA, the patients' rates of follow-up visits, and hospital readmissions. Researchers reviewed files for all patients (n=5778) admitted during an eleven-year timespan who had a diagnosis of traumatic brain injury (Marcoux et al., 2016). By utilizing hospital database and trauma registry database, researchers were able to code and identify the patients who left the hospital AMA. With such a focus on study population, the study count decreased to 106 patients (Marcoux et al., 2016). Upon review of the patients' hospital charts and databases mentioned above, Marcoux et al. (2016) collected demographic data, injury related data, and health or social-

related issues to fulfill their research objective of defining characteristics of patients leaving AMA and identifying risk of readmissions.

Results indicated that the most prevalent premorbid health or social-related issues were alcohol abuse (33%) and assault as a mechanism of trauma (33%) (Marcoux et al., 2016). Only 15 (14.2%) subjects came to follow-up visit for their traumatic brain injury (TBI) (Marcoux et al., 2016). Sixteen (15.1%) of the 106 subjects had multiple readmissions and/or ER visits related to substance abuse. Seven (6.6%) had multiple readmissions or ER visits with psychiatric reasons (Marcoux et al., 2016). Those patients with multiple readmissions and ER visits showed in higher proportion preexisting neurological condition ($p=0.027$), homelessness ($p=0.012$), previous neurosurgery ($p=0.014$), preexisting encephalomalacia ($p=0.011$), and had a higher injury severity score (ISS) ($p=0.014$) than those who were not readmitted multiple times (Marcoux et al., 2016). From the Marcoux et al. (2016) study, the research technique of a retrospective study and the review of demographic data to draw conclusions on characteristics and health conditions of patients who leave AMA was used for this study. On the contrary, because Marcoux et al. focused heavily on patients with mental illnesses and receiving behavioral health treatments, this study did not focus on this same population.

2.4 Approach by Baptist et al. Study

Baptist et al. (2007) presented a case control study design analyzing the limited data and research on patients diagnosed with asthma who left AMA versus being patients discharged with approval. Built as a retrospective study spanning six years of all asthma patients discharged AMA from 3 large Detroit hospitals, Baptist et al. (2007) used this opportunity to learn from a comparison of these patients with those who were discharged with medical provider approval. While their comparison groups are quite drastically different in numbers (180 left AMA vs 3,457 left with

approval), Baptist et al. (2007) did draw some defining demographics and characteristics about the asthma patients who left AMA.

Some of the results and findings of this study noted that "patients with asthma who left AMA were more likely to be younger, male, have Medicaid or lack insurance, require intensive care unit admission, and have a lower socioeconomic status than patients with asthma discharged with approval ($P < .05$ for all comparisons)" (Baptist et al., 2007). "There was no difference in race, day of the week admitted, or month admitted" (Baptist et al., 2007). "Among records that documented a reason for leaving AMA, the most common was dissatisfaction with care, although a variety of motives were found" (Baptist et al., 2007). "Finally, patients who left AMA were more likely to have an asthma relapse [and hospital readmittance] within 30 days" (Baptist et al., 2007). From this study, it was concluded that "patients with asthma who leave AMA have demographic and hospital admission characteristics that differ from those who leave with approval" (Baptist et al., 2007). Additionally, "the reasons why patients with asthma leave AMA are varied"; however, a common trend in data supported that "within 30 days, patients with asthma who leave AMA have much higher readmission and emergency department return rates" (Baptist et al., 2007).

From the Baptist et al. (2007) study, the plan used for a retrospective study, particularly with the focus on one health condition to create a comparison group, contributed to the development of this study. However, for this study, it is expected that data will yield a more balanced and research acceptable comparison group in numbers. Also, utilizing such variables as "day of the week admitted"; "month admitted"; and "require intensive care unit admission" were certainly worth including in the data analysis of this study as these are areas that have not been previously considered. The benefit of including "require intensive care unit admission" would highlight any potential research significance in this area for hospital patients who leave AMA, which to our knowledge, has not been examined in prior studies.

2.5 Approach by Hwang et al. Study

In a different research lens, Hwang et al. (2003) prospectively studied a group of patients who left an urban Toronto teaching hospital AMA. In their study, Hwang et al. (2003) examined rates of readmission and predictors of readmission among patients leaving the hospital AMA. Researchers "defined patients as leaving AMA if they signed a standard hospital form acknowledging that they were discharging themselves contrary to the advice of their physician or if they left the hospital in an unscheduled manner without informing hospital staff" (Hwang et al., 2003). "Between March 1997 and August 1998, there were 1,874 discharges from the general medicine service; this number does not include 205 deaths" (Hwang et al., 2003). "A total of 100 patients accounted for 113 discharges AMA and for patients who left AMA more than once during the study period, we included only the first time they left AMA" (Hwang et al., 2003).

In this study, "each patient who left AMA was paired with a control patient discharged routinely from the general medicine service between January 1997 and September 1998" (Hwang et al., 2003). "Control patients and AMA patients were matched according to sex and Case Mix Group (CMG), which identifies the primary reason for the hospital stay" (Hwang et al., 2003). In the Hwang et al. (2003) study, readmissions during a 90-day follow-up period were ascertained through review of databases at five hospitals including the primary hospital used in the study and "four nearby hospitals that provide care to patients from the catchment area" of the primary hospital (Hwang et al., 2003). "The charts of all patients who left AMA and were subsequently readmitted to the primary hospital were reviewed, as were records at the other hospitals if the patient had given consent for release of their information" (Hwang et al., 2003).

For analysis of the data obtained, researchers "used chi^2 tests to compare characteristics of the case and control patients and to examine characteristics associated with readmission among patients who left AMA" (Hwang et al., 2003). "Kaplan-Meier curves were used to examine time to

readmission and cox regression models were used to identify variables associated with readmission among all patients" (Hwang et al., 2003). "The slope of the Kaplan-Meier curve for patients who left AMA appeared to be steep during the first 2 weeks after leaving hospital and then appeared to level off"; in result, Hwang et al. (2003) "conducted a post-hoc analysis using stepwise regression models to test whether the Kaplan-Meier curves of case and control patients consisted of a single curve or multiple-phase joined curve with different slopes" (Hwang et al., 2003).

From the Hwang et al. (2003) study, the use of the Kaplan-Meier analysis was used to analyze hospital billing data obtained in this study. The unique feature that this analysis contributed to this study of examining time to readmission was quite valuable as it enabled researchers to learn of responses to the three variables of the study: length of stay, costs of care, and location of readmittance. Also, as the Hwang et al. (2003) study reviewed 90-day follow-ups for several hospitals, this study's data analysis included review of patients' readmission rates at 7 days and 30 days after initial admission into the hospital.

2.6 Building Blocks to this Study

From the work done in these three studies alone, it is evident that there has been evolvement from less to more sophisticated approaches, which ultimately produces more sound and fruitful results. In reviewing these study designs and data analysis, the next step for examining the issue of discharge AMA from the proposed research objective was to utilize a retrospective analysis of archival state readmissions data. The study design and data processes that Marcoux et al utilized with patients having traumatic brain injury served as an excellent framework for developing this study's methodology. Selection criteria were reduced to patients admitted into hospital during a certain number of years and having a particular diagnosis. Hospital database and diagnosis registry database were used to narrow the pool of study participants as regards to identifying patients who were

discharged AMA. The Ethics Review Board granted study approval and waived the requirement of obtaining informed consent from patients. Using this process offers a precise mechanism by which the correct study participants are identified, data gathered with discretion, and retrospective analysis can occur in a timely manner.

While healthcare providers exhibit this concern for patients discharged AMA and research studies have utilized a diverse array of types of patients (i.e., traumatic brain injury patients, asthma patients, hospital readmits) to display this point, there is still much room for scholastic development. Marcoux et al. (2016), Baptist et al. (2007), and Hwang et al. (2003) showcase two areas of research needed on the topic of discharge AMA. One area to be addressed is what the root causes are for patients choosing to be discharged AMA. The second area to be addressed is what are the characteristics of patients who chose to be discharged AMA and how these correlates to follow-up visits or hospital readmissions. These two areas of research can be further reviewed by data analysis of hospital admissions data in this study and patient satisfaction surveys in future studies. Research shows hospital admissions data has been quite useful in identifying the characteristics of patients who chose to be discharged AMA (Alfandre, 2009; Glasgow et al., 2010; Yong et al., 2013). On the contrary, little research has used patient satisfaction surveys for any studies regarding discharge AMA. Therefore, further studies are needed to understand the mechanisms behind these associations and address disparities specific to patients discharged AMA.

2.7 This Study's Contribution to Current Research

This study as relates to reviewing the risk of readmissions of hospital patients who leave AMA yielded a favorable opportunity to analyze hospital billing data for a "forgotten" study population. This population of interest was a comprehensive group indeed, yet one that provided a more holistic research perspective on how significant of an impact leaving AMA has upon patients,

providers, and payers. This group of patients included individuals who represent a vast array of races, ethnicities, socioeconomic statuses, literacy groups, and healthcare challenges. This group of patients utilized for this study did not limit data analysis to patients who have mental illnesses and who receive behavioral health services, yet instead included those patients with non-mental health conditions who feel that they should LAMA. It is important to understand who these patients are, so that we may serve them better. This largely "forgotten" study population may have very different risks and outcomes associated with leaving AMA than what is reported for behavioral health patients. It is critical to understand the medical conditions and readmission patterns of this patient group because it is very unlikely that their needs are met by interventions aimed at behavioral health patients who leave AMA.

3. Chapter III METHODOLOGY

3.1 Study Variables

As this study commenced, literature was searched in Medical University of South Carolina (MUSC) libraries, PubMed and Scopus, on key terms including but not limited to “self-discharge”; “patients leaving AMA”; “against medical advice”; “DAMA”; “discharge against medical advice”; and “hospital patients DAMA”. From review of literature, prior studies utilized several statistical tests to analyze hospital patients’ admissions data for identifying causes of discharge against medical advice and assessing patients’ risk of readmissions. Some of these types of studies and tests included chi-square test and logistic regression modeling (Ashrafi et al., 2017); retrospective analysis and multivariate logistic regression modeling (Haines et al., 2020); and a further set of logistic regression models (Ibrahim et al., 2007). It was definitely evident that prior research often utilized logistic regression modeling to fulfill the research need regarding this topic area of patients leaving AMA. However, for this research project, a different statistical test, the Kaplan–Meier analysis, was used for data analysis. The aim of this study was to analyze hospital billing data of patients who are readmitted after leaving AMA by seeking out three variables. These variables were:

1) Patients’ length of stay once readmitted into the hospital
2) Charges/costs associated with the care provided during the readmitted visit
3) Percent of patients readmitted to inpatient hospital rooms vs. admitted to nursing home care

In the statistical analysis of this data, these three study variables were referred to by shorthand as:

1) Length of Stay (LOS)
2) Costs of Care (TOTCHG)
3) Location of Readmittance (DaysToRe)

In consideration of this aim and these variables, it would not have been most advantageous for research purposes to have used only logistic regression modeling considering that this form of

statistical testing is the standard way to model binary outcomes. Such binary outcomes would be fruitful for determining if hospital patients who leave AMA are readmitted within 30 days (response: yes or no) or for identifying when these patients are readmitted how their original condition has changed (response: worsened or lessened). The use of this statistical testing is fruitful in these cases, yet for this research project, it was even more beneficial to utilize Kaplan–Meier analysis in addition to logistic regression. The Kaplan–Meier method was used particularly in the analysis of time to event data. Time to event means the time from entry into a study until a particular event, for example onset of illness. Regarding this study, the Kaplan-Meier analysis or "product limit estimator" yielded more impactful and knowledgeable results regarding the predictors and variables of hospital patients readmitted after leaving AMA. This analysis bridged the gap in demographics and identifiable characteristics of these patients as well as assessed the variables listed above.

3.2 Study Population and Data Source

The selected study is a retrospective analysis of archival data on hospital readmissions and patients leaving facilities against medical advice. The approach taken was analyzing hospitals' billing data of patients spanning the states of Florida, Georgia, Kentucky, and Mississippi, who have left facilities AMA. Data used in this study came from all-payer admissions and discharge records for these four states for the year of 2017 from the Comparative Effectiveness and Data Analytics Research Resource (CEDAR) core at the Medical University of South Carolina (MUSC). This study's data was extracted and analyzed in the summer of 2021.

The data source used to review and analyze hospital readmissions and billing data for the states listed above was the data for original AMA admissions for non-drug use or psychiatric hospital readmissions from the State Inpatient Databases (SID) of the Healthcare Cost and Utilization Project (H-CUP). H-CUP is a nationally recognized project, sponsored by the Agency for Healthcare

Research and Quality through a Federal-State-Industry partnership (HCUP, 2021). This consortium of healthcare databases and related products encompasses the largest collection of longitudinal hospital care data in the United States (HCUP, 2021). SID are State-specific files that contain all inpatient care records in participating states (SID, 2021). Together, these databases encompass more than 95 percent of all U.S. hospital discharges (SID, 2021). The uniform format of the SID helps facilitate cross-state comparisons and are well suited for research that requires complete inventory of hospitals and discharges within geographic areas or states such as this study (SID, 2021).

3.3 Research Questions

The research questions for this study were as follows:

Question 1. What are the characteristics of patients, excluding populations with psychiatric and mental health diagnoses, who leave hospitals AMA?

Question 2. What is the rate of early readmission (within 7 days) and later readmissions (within 30 days of discharge)?

Question 3. What are the diagnoses, length of stay, and discharge destinations for those readmitted for hospital stays for these medical and surgical patients who leave AMA?

3.4 Data Analysis

The following steps were completed: 1) conducted data search using CEDAR hospital billing data for patients who have left facilities against medical advice; 2) built filter and removed patients with primary diagnoses of mental illness or substance abuse and patients who are uninsured; 3) developed graphs of demographic variables (i.e. racial groups, insurance coverage, income level) and morbidity rates (most common and least common health conditions as defined by the initial letter used in the primary diagnosis ICD-10 codes); and 4) developed summary of findings and built a

conclusion regarding patient characteristics and medical mistakes which could yield implications for future research.

In analyzing data, a set of logistic regression models were used to examine hospital readmission using the billing data for patients leaving AMA and summary statistics assessed using t-tests and chi-square tests for continuous and categorical variables, respectively. From review of the data set constructed, used a coding mechanism and identified demographic characteristics and diagnosis related data to draw conclusions. From the summary of findings and data review, drew conclusions on characteristics, readmission rates, and contribution (or impact) to adequately respond to the research questions for this study. The desired conclusions to be drawn should provide answers to the research questions and accomplish the following:

1) Identify characteristics that describe patients who choose to leave AMA who do not have psychiatric or substance abuse diagnoses

2) Identify the rate of early readmission (within 7 days) and later readmissions (within 30 days of discharge

3) Describe the reasons for readmission by type of ICD-10 code used as the primary diagnosis, the length of stay and cost of the readmission and the characteristics of discharges for the readmission (discharged LAMA again, discharged home or discharged dead or to nursing home care) of patients leaving AMA

All data were analyzed using SAS Version 9.4 software (Cary, NC).

4. Chapter IV RESULTS

4.1 Results/Findings

We extracted hospital discharge records from four states in 2017 for patients with a discharge destination value of 7, the HCUP data code for patients who have left facilities against medical advice (AMA). We removed patients with primary diagnoses or a comorbid condition with ICD-10 codes related to psychiatric illness or substance abuse. Of all the LAMA discharges, only 29.8% had no PS condition coded. These 29.8% of admissions were used for further analysis to yield results that would provide answers to the three research questions.

In the steps to answer these questions, we described the demographic variables of age, sex, racial groups, insurance coverage, location by state, and country income quartile, to name a few. We then linked the initial admission (Index Admission) to subsequent admissions using the encrypted patient identifier variable and recorded the days to the readmission according to the following benchmarks:

- Patients being readmitted from 0 to 7 days after the initial admission
- Patients being readmitted from 0 to 30 days after the initial admission

We described the characteristics of the readmission: length of stay (LOS), if the readmission was to the original hospital, discharge destination, whether nursing home, transfer to another hospital, home, or even death. We described the main types of diagnoses recorded for the readmission.

Characteristics of LAMA Patients for the Initial Admission

Upon completing the data analysis for the variables of Question #1, the descriptive statistics of these patients, as seen below in Table 1, provide information on the characteristics of the study population. In response to Question #1 as provided below, the data obtained indicate the following:

1) What are the characteristics of patients, excluding psychiatric populations and mental health diagnoses, who leave hospitals against medical advice?

Table 1: Demographic and admission characteristics of patients from the states of Florida, Georgia, Kentucky, and Mississippi who left against medical advice (LAMA) in 2017.

Variable Name	Patient and Admission Characteristic N=24,407	Statistic
***Age mean* (SD)**	52.1 (19.6)	
Sex n (%)[1]:		P < .0001
Male	14,282 (58.5)	
Female	10,124 (41.5)	
Race n (%):		P < .0001
Black	7,196 (29.5)	
White	11,767 (48.2)	
Hispanic	4,623 (18.9)	
Other	821 (3.4)	
Insurance Coverage n (%):		P < .0001
Medicaid	5,421 (22.2)	
Medicare	9,923 (40.7)	
Other	1,352 (5.5)	
Private	3,849 (15.8)	
Uninsured	3,862 (15.8)	
ER Use Before Admission n (%):		
Yes	21,941 (89.9)	
No	2,466 (10.1)	
Location by State n (%):		
Florida	18,601 (76.2)	
Georgia	3,714 (15.2)	
Kentucky	1,298 (5.3)	
Mississippi	794 (3.3)	
Median Household Income n (%)[2]:		
Level 1—Lowest income quartile	12,014 (50.6)	
Level 2	6,842 (28.8)	
Level 3	3,607 (15.2)	
Level 4—Highest income quartile	1,274 (5.4)	
Mean Length of Stay mean (SD)	2.2 (4.2)	
Mean Total Charges mean (SD)[3]	$33,084 (51,919)	
Mean Number of Diagnoses mean (SD)	9.3 (6.0)	

[1] Sex has Frequency Missing 1.

[2] Median Household Income has Frequency Missing 670.

[3]Mean Total Charges has Frequency Missing 15.

We identified a total of 24,407 patients who did not have psychiatric or mental health diagnoses and left the hospital against medical advice. Of these a majority were male (58.5%; $p < .0001$) and almost half were of White race (48.2%; $p < .0001$). We noted that one patient did not indicate their sex, for whatever reason, and thus were omitted from the data analysis of this characteristic ($n = 24,406$). The mean age was 52.1 years (SD 19.6). Insurance coverage ($p < .0001$) was primarily Medicare (40.7%) and then Medicaid (22.2%) in stark contrast to the equal distribution among patients with private insurances (15.8%) and patients uninsured (15.8%). The outlier of patients were those who identified as other insurers (5.5%).

Most patients (89.9%) did utilize the Emergency Room (ER) before being admitted into the hospital. The state distribution of patients leaving AMA noted a majority located in Florida (76.2%), with the remaining 23.8% of patients located in Georgia (15.22%), Kentucky (5.32%), and Mississippi (3.25%). The median household income of the study population was subdivided into 4 nationally ranked income levels: Level 1 as lowest income quartile of the U.S. (50.6%), Level 2 (28.8%), Level 3 (15.2%), and Level 4 as highest income quartile of the U.S. (5.4%). The mean length of stay of patients was 2.2 days (SD 4.2), or nearly 53 hours. The mean total charges per admission were $33,084 (SD 51,919). Lastly, the mean number of diagnoses for patients were 9.3 (SD 6.0) illnesses or health conditions.

Characteristics of LAMA patients who were readmitted

Upon completing the data analysis for the variables of Question #2, the descriptive statistics of these patients, as seen on the next page in Table 2, provided information on the challenges associated with readmittance of the study population. In response to Question #2 as provided below, the data obtained indicate the following:

2) What is the rate of early readmissions (within 7 days) and later readmissions (within 30 days of discharge)?

Table 2: Readmission frequencies and characteristics of the readmissions of patients from the states of Florida, Georgia, and Mississippi in 2017.

	Patients' Readmission			***Reason for Discharge***				
Variable	**After 7 Days**	**After 30 Days**	**To Same Hospital**	**Died**	**Went Home**	**Leave Against Medical Advice**	**Nursing Home**	**Transfer**
N	**19,564**	**19,564**	**8,816** *(Frequency Missing 10,748)*	**8,815** *(Frequency Missing 10,749)*				
Patient and Readmission Characteristic N (%)	**7,283** (37.2)	**8,816** (45.1)	**7,076** (80.3)	**106** (1.2)	**3,035** (34.4)	**5,217** (59.2)	**368** (4.2)	**89** (1.0)

We identified a total of 19,564 patients who met our inclusion criteria for this component of the data analysis for this study. In review of the rate at which patients were being readmitted, 7,283 (37.2%) patients were readmitted after 7 days. There were 8,816 (45.1%) patients readmitted after 30 days. Regarding location, 7,076 (80.3%) patients were readmitted to the same hospital (frequency missing of 10,748). Raw data highlighted five key reasons for patients being discharged. The frequency missing for this variable of reason for discharge was 10,749. The characteristics associated with these five reasons for discharge are: Died (1.2%), Went Home (34.4%), LAMA (59.2%), Nursing Home Admission (4.2%), and Transfer to another facility (1.0%).

Table 3: Characteristics of the readmissions of patients by their type of discharge from hospital.

Reason for Discharge & Variables	Number of Patients Observed	Patient and Readmission Characteristic
Died	106	
Length of Stay Mean (SD)		9.1 (10.1)
Total Charges Mean (SD)		$169,288 (169,900)
Age in years at admission Mean (SD)		64.3 (17.2)
Days to being readmitted Mean (SD)		5.5 (6.7)
Went Home	3,035	
Length of Stay Mean (SD)		5.2 (5.8)
Total Charges Mean (SD) *(Freq. Missing 1)*		$60,348 (71,420)
Age in years at admission Mean (SD)		51.5 (18.6)
Days to being readmitted Mean (SD)		8.1 (8.6)
Leave Against Medical Advice	5,217	
Length of Stay Mean (SD)		0.2 (1.4)
Total Charges Mean (SD) *(Freq. Missing 7)*		$19,603 (20,685)
Age in years at admission Mean (SD)		51.3 (19.6)
Days to being readmitted Mean (SD)		0.6 (3.2)
Nursing Home (NsgH)	368	
Length of Stay Mean (SD)		10.8 (12.2)
Total Charges Mean (SD) *(Freq. Missing 1)*		$126,236 (160,478)
AGE Mean (SD)		68.3 (14.3)
DaysToRe Mean (SD)		7.2 (8.6)
Transfer	89	
Length of Stay Mean (SD)		7.2 (9.8)
Total Charges Mean (SD)		$92,364 (139,812)
Age in years at admission Mean (SD)		56.9 (15.9)
Days to being readmitted Mean (SD)		7.1 (7.8)

Per the types of discharge, descriptive statistics obtained, as provided above in Table 3, offered additional information in the areas of the variables: Length of Stay (LOS), Cost of Care (TOTCHG), Age in years at admission (AGE), and Average Days to Readmission (DaysToRe). From review of these characteristics of the readmissions of patients by their type of discharge, the type of discharge with the greatest number of patients was LAMA (n=5,217), yet the type with the least number of patients was transfer (n=89). Patients who died incurred the highest cost of total charges at $169,288 while patients LAMA incurred the lowest cost of total charges at $19,603. Patients LAMA had the shortest length of stay at 0.2 days, whereas patients admitted to Nursing Home had the

longest length of stay at 10.8 days. Patients who were medically discharged to go home had the most days of 8.1 before being readmitted while patients having LAMA were readmitted in the shortest amount of time of 0.6 days. Patients admitted to Nursing Home displayed the highest age in years at readmission of 68.3 years old, whereas patients LAMA displayed the youngest age of 51.3 years old.

Impact of LAMA Patients' Decision

Upon completing the data analysis for the variables of Question #3, the medical coding statistics of these patients provided information on the diagnoses associated with readmittance of the study population. In response to Question #3 as provided below, the data obtained indicate the following:

3) What are the diagnoses, length of stay, and discharge destinations for those readmitted for hospital stays for these medical and surgical patients who leave AMA?

Figure 2: ICD-10 code characteristics of the Principal Diagnoses of patients LAMA.

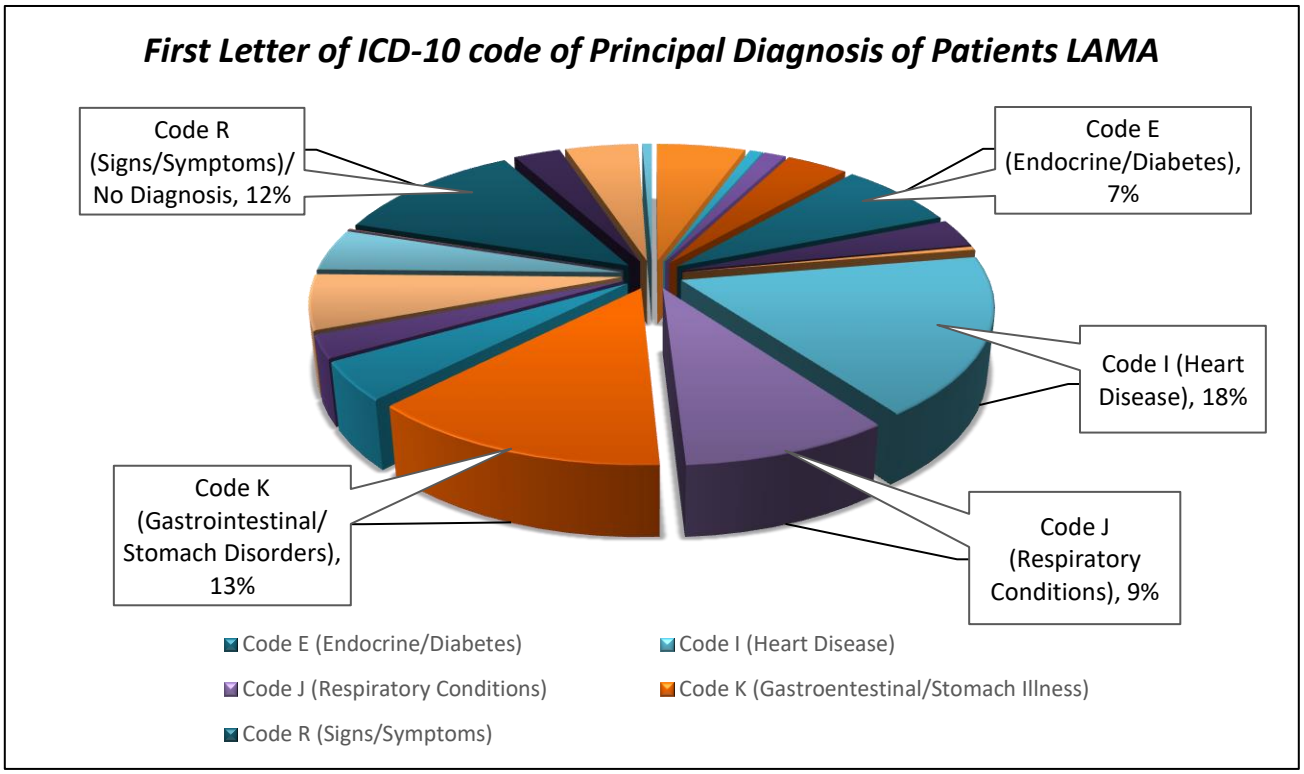


Figure 3: ICD-10 codes and reported diagnoses

All ICD-10 codes will begin with one of the following letters of the alphabet; the alpha characters are not case sensitive. The most commonly reported diagnoses for chiropractic are likely to begin with an "M" or an "S".

A & B	Infectious and Parasitic Diseases
C	Neoplasms
D	Neoplasms, Blood, Blood-forming Organs
E	Endocrine, Nutritional, Metabolic
F	Mental and Behavioral Disorders
G	Nervous System
H	Eye and Adnexa, Ear and Mastoid Process
I	Circulatory System
J	Respiratory System
K	Digestive System
L	Skin and Subcutaneous Tissue
M	**Musculoskeletal and Connective Tissue**
N	Genitourinary System
O	Pregnancy, Childbirth and the Puerperium
P	Certain Conditions Originating in the Perinatal Period
Q	Congenital Malformations, Deformations and Chromosomal Abnormalities
R	Symptoms, Signs and Abnormal Clinical and Lab Findings
S	**Injury, Poisoning, Certain Other Consequences of External Causes**
T	Injury, Poisoning, Certain Other Consequences of External Causes
U	no codes listed, will be used for emergency code additions
V, W, X, Y	External Causes of Morbidity (homecare will only have to code how patient was hurt; other settings will also code where injury occurred, what activity patient was doing)
Z	Factors Influencing Health Status and Contact with Health Services (similar to current "V-codes")

Table 4: ICD-10 categories and characteristics of the Principal Diagnoses of patients LAMA.

ICD Category Names (ICD-10 Code Initial)	Patient and Readmission Characteristic N=19,564
Frequency Missing = 20	
Infectious and Parasitic Diseases (A & B)	1072 (5.5) & 159 (0.8)
Neoplasms (C)	263 (1.4)
Neoplasms, Blood, Blood-forming Organs (D)	742 (3.8)
Endocrine, Nutritional, Metabolic (E)	1446 (7.4)
Nervous System (G)	612 (3.1)
Eye and Adnexa, Ear, and Mastoid Process (H)	75 (0.4)
Circulatory System (I)	3435 (17.6)
Respiratory System (J)	1794 (9.2)
Digestive System (K)	2606 (13.3)
Skin and Subcutaneous Tissue (L)	834 (4.3)
Musculoskeletal and Connective Tissue (M)	495 (2.5)
Genitourinary System (N)	1190 (6.1)
Pregnancy, Childbirth, and the Puerperium (O)	909 (4.7)
Certain Conditions Originating in the Perinatal Period (P)	5 (0.03)
Congenital Malformations, Deformations, and Chromosomal Abnormalities (Q)	12 (0.1)
Symptoms, Signs, and Abnormal Clinical and Lab Findings (R)	2334 (11.9)
Injury, Poisoning, Certain Other Consequences of External Causes (S & T)	562 (2.9) & 884 (4.5)
Factors Influencing Health Status and Contact with Health Services (similar to current "V-codes") (Z)	115 (0.6)

The pie chart (Figure 2) and vertical table (Table 4) above highlight the significant findings of this study as relates to the impact which the patients' decision to leave AMA has upon their health status upon being readmitted**.** While Figure 2 offers a more pictorial representation of the number of patients (percentages) associated with the ICD-10 codes, Table 4 provides a numerical overview of

this data. Table 4 shows the frequency of ICD-10 codes which begin with 20 different letters of the alphabet, as noted in Figure 3. From review of these ICD-10 categories, the following have the highest number of patients coded for their original Principal Diagnosis: Circulatory System with 3,435 (17.6%) patients; Digestive System with 2,606 (13.3%) patients; Symptoms, Signs, and Abnormal Clinical and Lab Findings with 2,334 (11.9%) patients; Respiratory System with 1,794 (9.2%) patients; and Endocrine, Nutritional, Metabolic with 1,446 (7.4%). The category names with the lowest number of patients coded for their original Principal Diagnosis are Certain Conditions Originating in the Perinatal Period with 5 (0.03%) patients; Congenital Malformations, Deformations, and Chromosomal Abnormalities with 12 (0.1%) patients; Eye and Adnexa, Ear, and Mastoid Process with 75 (0.4%) patients; and Factors Influencing Health Status and Contact with Health Services (similar to current “V-codes”) with 115 (0.6%) patients.

5. Chapter V DISCUSSION

5.1 Discussion of Results

Nearly 70% of hospital patients across the states of Florida, Georgia, Kentucky, and Mississippi who LAMA were patients of psychiatric populations and received mental health diagnoses. The remaining 29.8%, however, were patients who LAMA and were patients with no psychiatric or mental health diagnoses. Yes, this population initially appears to be a minority, yet this study's research highlights why this small "forgotten" group is still so very significant. In this study, the exclusion criteria applied to the study population ensured that patients of psychiatric populations and those having received mental health diagnoses were not included in this study. As Brook et al. (2006) noted, a much larger amount of literature has already examined psychiatric inpatients and AMA discharges. In fact, clinical overlap exists between medical and psychiatric patients studied because of the high burden of psychiatric morbidity in medical inpatients; however, data are too diverse to allow wide-ranging comparisons. A prime example being how "AMA discharges in psychiatric populations range from 3% to 51%, far higher than in medical patients studied" (Brook et al., 2006). Since there is such a plethora of studies focused on patients with psychiatric and mental health diagnoses, it is quite evident that there is a gap in knowledge and research on the "forgotten" population representing this 29.8%. Therefore, we eagerly accepted the challenge to begin building a bridge that would eliminate this gap between patient, provider, and researcher.

Data was selected for analysis only for non-psychiatric patients who sought out medical assistance yet LAMA during the year 2017 within the states of Florida, Georgia, Kentucky, and Mississippi. In this study, the results obtained provided statistical and narrative responses in answering the study's three research questions. These research questions provided a roadmap for purposely navigating the route in which to scientifically examine the risk of readmissions for medical and surgical patients who "self-discharge" leaving hospitals against medical advice.

Characteristics of LAMA Patients for the Initial Admission

From this study, results provided several categorical variables to help present admission characteristics for the study population. Following similar methodology from the studies of Alfandre (2009); Glasgow et al. (2010); and Yong et al. (2013), this study utilized demographic variables of age, sex, race, insurance coverage, location by state, and household income to best describe these patients who LAMA. With further review of the demographic and admission characteristics of these patients who LAMA, we noted that nearly 90% of patients used the ER before being admitted into the hospital. This finding could inform us of several possibilities: that an astounding majority of this population had enough concern for their health to get to the ER but could possibly have not had enough trust in health care providers to remain and receive full treatment. It could have also been that these patients became dissatisfied with the quality of care or lack thereof being provided to them by health care providers. Perhaps it could have been rationale unrelated to the hospital or doctor such as the patients just not being able to afford missing workdays due to being sick and/or admitted into the hospital. Furthermore, more than three-fourths (76.2%) of patients live in the state of Florida while only 3.3% live in Mississippi. As many are aware, Florida generates significantly more income and resources than states such as Mississippi, thus there is currently much room for speculation as not enough research has been completed to identify more concrete rationales for such profound findings. The top five ICD-10 codes highlight 1) heart disease; 2) gastrointestinal disorders; 3) signs/ symptoms, but no disorder diagnoses; 4) respiratory conditions; and 5) diabetes/endocrine disorders.

Characteristics of LAMA Patients who were Readmitted

Being readmitted to the hospital following a discharge, whether approved or LAMA, is a direct indication that the patient's health and wellness is not substantial enough to be managed without direct care from hospital personnel. Results from this study highlighted rates of readmission

of patients who LAMA and reasons for discharge, which also acknowledged patient's discharge destination. From the data obtained, it became consistently intriguing in noticing the findings as presented in Table 2. In this table, a rising pattern in rate of readmissions noted that as more time passes following discharge, the higher percentage of patients who are readmitted (37.2% after 7 days and 45.1% after 30 days). Furthermore, 80.3% of these patients were readmitted to the same hospital. These were quite astonishing results, particularly when further considering that of these 80% readmitted to the same hospital, 59.2% LAMA a second time.

In review of such captivating results as these, researchers would desire to know the qualitative data to couple with this quantitative data to tell the full story of the phenomenon of patients LAMA. Having qualitative data such as patients' reasons for LAMA, the state of health care facilities, the professionalism and skillset of health care professionals at these facilities, and the perspectives of these health care professionals regarding patients who LAMA would be tremendously helpful for researchers to comprehend "the why" to these numbers. The blend of qualitative and quantitative data on this subject matter would potentially convert these discoveries into meaningful conversation starters and foundations upon which life-changing work can be implemented in health care systems and communities all over this country. In fact, such work could not only change lives of health care providers, but ultimately save lives of patients from underserved populations who lack access to care, belief in health care systems, and confidence in self-advocacy for their own health and wellness.

Impact of LAMA Patients' Decision

At the brink of reviewing literature to develop this study's research questions, it was quite evident that the concept of LAMA was more common and prevalent than not. Researchers around the world have defined this concept, studied it, conducted valuable research studies on it, and presented numerous findings to audiences. Yet, one key missing piece to this puzzle of the concept LAMA is

the reflective thoughts of the patients who LAMA as they are making the decision to do so. While some researchers may deem these thoughts to be trivial and insignificant, they truly are a highlight of all research addressing patients who LAMA because it helps us all better comprehend patients' needs and expectations for quality health care. Furthermore, it is important to understand who these patients are, so that we as health administrators may serve them better.

When one single patient in a single hospital in a single town in a single state chooses to LAMA and then minutes later another single patient in another single hospital in another single town in another single state follows suit, there are now two similar occurrences in different places that are impacting hundreds of people (the patients who LAMA and patients within same department who remain at facility; hospitals' admissions and discharge personnel; health care providers; hospitals' billing staff; hospitals' EMT, transporters, and safety officers; and hospitals' administrators). Can you imagine that all of these individuals' workday is profoundly impacted because one single patient chooses to sign a paper refusing treatment and walk out the door headed back into a society that is limited to meet their health care need? Researchers who envision this real-life scenario, yet do not see the substantial impact of a LAMA patient's decision should inquire of themselves their true purpose for conducting human and medical research. For a patient's decision to LAMA, readmit into hospital, and then LAMA again impacts that patient's overall wellness (mentally, emotionally, and physically, to name just a few).

The gains from this study in regard to comprehending and developing an appreciation of this impact of patients' decision to LAMA were showcased in some of the results from Table 3 which informed that patients who were medically discharged to go home had the most days of 8.1 before being readmitted while patients having LAMA were readmitted in the shortest amount of time of 0.6 days. Additionally, patients admitted to Nursing Home displayed the highest age in years at readmission of 68.3 years old, whereas patients LAMA displayed the youngest age of 51.3 years old.

From these results, it is evident that patients who LAMA would be readmitted almost 14 times faster than patients who were discharged with approval from their health care providers. Furthermore, patients in their early 50s were the primary patients to LAMA. This information lets researchers know that offering extensive health education resources to all patients, particularly those with history of LAMA, would be tremendously advantageous. Such resources could enlighten patients' knowledge of healthy eating, exercise, and other lifestyle enhancements that can enrich their mental wellbeing and decrease their risk for hospital readmissions. Upon implementing such activities as these, a research study has the potential to evolve into a transformative health care system benefitting patients, providers, and proud communities through integrity, collaboration, creativity, diversity, and excellence.

5.2 Limitations

As this study unfolded and results were obtained, it became evident that several limitations prevented the attainment of more results and development of greater conclusions. The hospital admissions data used were limited by patients' records in where a few records omitted information such as sex or race, which thus forced them to be removed from the data pool used for analysis. Within the data analysis on hospital readmissions, the state of Kentucky was not included as we could not reliably link the data from Kentucky for this component of the research. Therefore, only three states of data were analyzed regarding rate of readmissions. Additionally, it was inquired of what portion of the study population uses the ER or hospital as their patient centered medical home (PCMH) for primary care services. This serves as a limitation for this study because we were unable to control for this characteristic as this is a behavior that is not restricted to any of the described demographic variables, such as a certain insurance plan or median household income.

In addition, it was also noted that this study was limited in capturing patients who leave hospitals AMA and die prior to a hospital readmission. From a research perspective, this is simply a challenge for future researchers as death is a potential medical outcome for patients who leave AMA. This study does not consider the issue of death and patients who leave AMA who die, following discharge, for interestingly enough, this information is not available as it is not recorded on hospital billing records. Lastly, this study was limited regarding the exclusion of patients who visited the ER but were not admitted into the hospital. This exclusion criteria was implemented as a means of avoiding the challenge of missing data (i.e., patients who check-in and register to be seen at the ER, but while waiting, get up and leave, thus not staying for a full visit to develop a medical bill, have a record of diagnosis, nor interact with health care providers to obtain medical service and proper recommendation for treatment).

5.3 Future Research

As presented, researchers embraced a number of limitations during the development and data analysis of this study. With this in mind, there have been identified a number of opportunities for future research which are described below.

Is there anything that makes patients uncomfortable with remaining at hospitals to receive the health care services needed? If so, are these areas of concern identified as Triple Aim failure points? For patients who choose to leave AMA, are they maximizing or minimizing the hospital/health care centers' effectiveness of implementing the three dimensions of the Triple Aim? Examining this concept of "self-discharge" holds great significance for patients, providers, and payers. For the patient, more concise information can identify if time of service or provider satisfaction are issues to be fixed. For the provider, higher quality performance ratings can be obtained, and more patients can be reached, ultimately decreasing the number of persons in the community living with undiagnosed

illnesses and diseases. For the payer, such a profound research study would distinguish excessive financial burdens that community hospitals undergo for health providers' time, knowledge, and medical tools that have been sought after and opened but unused due to patients leaving AMA. Ultimately, enhancements in quality improvement should yield fruitful results for hospital records completion and review of medical mistakes.

In reviewing this process further, the data collection and analysis could be improved when identifying demographic characteristics and diagnosis related data. When patients are admitted, hospital records must be thoroughly completed and filed with as much demographic data as possible to ensure that disparities can be accurately determined. Additionally, the presence of conciseness during both steps of hospital admissions and discharge will eliminate failure to reach agreement on importance of continued care between the providers and patients. For providers to take extra steps to ensure all information is complete will further enhance health care delivery to patients, provider score ratings by patients, and possibly decrease in discharge AMA by patients, as noted in Baptist et al. (2007).

Further primary data research opportunities could involve patient satisfaction surveys and employer and site reviews obtained via key informant interviews and focus groups with health care professionals at different hierarchy levels to obtain employee perspectives on patients leaving AMA. An extension of this recommended research opportunity would be a more in-depth analysis on the intriguing discovery that more than 50% of patients who left AMA, returned to hospital for readmission, and then choose to leave AMA again. Future researchers can find a plethora of tools and methods including interviews of patients to better gauge the rationale for why patients do this. Upon completing this step, researchers along with a team of health care professionals and public health practitioners can build a toolkit that will offer health education for patients and continuing education

for health care professionals to ensure patients get satisfactory treatment, medications, knowledge, and awareness support in a timely manner.

Last but certainly not least, future researchers can develop a study that addresses this study's limitation of accounting for patients who leave AMA and die before a readmittance is possible. In fact, a suggested way to address this issue of death is to conduct an anthropological study that would incorporate research areas of ethics, family involvement, and death notices. Dependent upon the perimeter of the study population, these notices could be obtained from local health departments or state government offices. Additionally, it would be interesting for future researchers to look more into the top five ICD-10 code areas that represent the key areas of diagnoses applicable to the "forgotten" population who leave AMA. This being an area where to our knowledge, no studies have examined patients who leave AMA and receive any of these top 5 diagnoses areas in Southern states' hospitals versus a comparison group of patients with any of these diagnoses in Southern states' hospitals who are discharged with medical professionals' consent.

5.4 Conclusions

LAMA is not a big magnitude problem, but it is a significant health challenge needing to be addressed within the "forgotten group" of patients, as seen in this study. This "forgotten group", comprised of all patients LAMA excluding those with psychiatric and mental health related diagnoses, showcases a vast array of chronic health challenges which makes this group very significant. In statistically determining the key characteristics of this group of patients, researchers can begin the process of comprehending similarities of such patients across this study's geographical area, with hopes to develop future studies spanning patients' hospital billing data for other regions of the United States.

As this study's results unfolded, it was acknowledged that patients being transferred from one hospital to another have specific billing codes separate from the codes assigned to patients who leave AMA. Also, patients who are readmitted after 30 days have likely taken advantage of the opportunity to utilize home remedies, over-the-counter medications, and follow-up visits to primary care physicians/PCMH (patient-centered medical homes). Furthermore, an unexpected 59% of these patients LAMA, return to hospital for readmittance, and LAMA once again. Reaching this conclusion through this study has already produced a research and compassionate spark of intrigue among the principal author and committee members with the exploratory task of answering, "why would a patient leave the hospital AMA, particularly a second time within 30 days of the patients' first visit?" Could it be lack of trust of healthcare providers, dissatisfaction of services provided, or even disagreement with recommended treatments in response to the patients' conditions? All these factors could indeed contribute to these patients leaving AMA a second time, yet limited research supports these considerations. It is from all these conclusions that future research has been developed.

References

Albayati, A., Douedi, S., Alshami, A., Hossain, M. A., Sen, S., Buccellato, V., Cutroneo, A., Beelitz, J., & Asif, A. (2021). Why Do Patients Leave against Medical Advice? Reasons, Consequences, Prevention, and Interventions. *Healthcare (Basel, Switzerland)*, *9*(2), 111. https://doi.org/10.3390/healthcare9020111

Alfandre D. J. (2009). "I'm going home": discharges against medical advice. *Mayo Clinic proceedings*, *84*(3), 255–260. retrieved from https://doi.org/10.1016/S0025-6196(11)61143-9.

Alfandre, D. Reconsidering Against Medical Advice Discharges: Embracing Patient-Centeredness to Promote High Quality Care and a Renewed Research Agenda. *J GEN INTERN MED* 28, 1657–1662 (2013). https://doi.org/10.1007/s11606-013-2540-z

Appelbaum, PS, & Roth, LH. Patients Who Refuse Treatment in Medical Hospitals. *JAMA.* 1983; 250(10):1296–1301. doi:10.1001/jama.1983.03340100030024.

Ashrafi, E., Nobakht, S., Keykaleh, M. S., Kakemam, E., Hasanpoor, E., & Sokhanvar, M. (2017). Discharge against medical advice (DAMA): Causes and predictors. Electronic physician, 9(6), 4563–4570. https://doi.org/10.19082/4563.

Baptist, A.P., Warrier, I., Arora, R., Ager, J., & Massanari, R.M. (2007). Hospitalized patients with asthma who leave against medical advice: Characteristics, reasons, and outcomes. The Journal of Allergy and Clinical Immunology: Health Care Education, Delivery, and Quality, 119 (4), 924-929. doi: 10.1016/j.jaci.2006.11.695.

Berger, J.T. Discharge against medical advice: ethical considerations and professional obligations. J Hosp Med. 2008; 3:403-8. 2.

Brook M, Hilty DM, Liu W, Hu R, Frye MA. Discharge against medical advice from inpatient psychiatric treatment: a literature review. *Psychiatr Serv.* 2006;57(8):1192-1198.

Carrese JA. Refusal of care: patients' well-being and physicians' ethical obligations: “but doctor, I

want to go home". *JAMA* 2006;296(6):691-695.

Devitt, P. J., Devitt, A. C., & Dewan, M. (2000). Does identifying a discharge as "against medical advice" confer legal protection?. *The Journal of family practice*, *49*(3), 224–227.

Devitt, P.J., Devitt, A. C., & Dewan, M. (2000). An examination of whether discharging patients against medical advice protects physicians from malpractice charges. Psychiatr Serv (Washington, DC). 2000;51(7):899–902.

Ding R, Jung J, Kirsch TD, Levy F, McCarthy ML. Uncompleted emergency department care: patients who leave against medical advice. Acad Emerg Med 2007;14:870–6.

El Malek VA, Alexander S, Al Anezi F. Discharge against Medical Advice among Children Admitted into Pediatric Wards at Al-Jahra Hospital, Kuwait. *Kuwait medical journal.* 2014;46(1):28–31.

Farber, Post L, Blustein, J, Dubler, N. N. Handbook for health care ethics committees. New York, NY: Johns Hopkins University Press; 2006.

Fiscella K, Meldrum S, Barnett S. Hospital discharge against advice after myocardial infarction: deaths and readmissions. *Am J Med.* 2007;120(12):1047–53. doi: 10.1016/j.amjmed.2007.08.024.

Glasgow, JM, Vaughn-Sarrazin, M, Kaboli, PJ. Leaving against medical advice (AMA): risk of 30-day mortality and hospital readmission. J Gen Intern Med. 2010;25:926-929.

Haines, K., Freeman, J., Vastaas, C., Rust, C., Cox, C., Kasotakis, G., Fuller, M., Krishnamoorthy, V., Siciliano, M., Alger, A., Montgomery, S., & Agarwal, S. (2020). "I'm Leaving": Factors That Impact Against Medical Advice Disposition Post-Trauma. The Journal of emergency medicine, 58(4), 691–697. https://doi.org/10.1016/j.jemermed.2019.12.023.

HCUP Home. Healthcare Cost and Utilization Project (HCUP). July 2021. Agency for Healthcare Research and Quality, Rockville, MD. www.hcup-us.ahrq.gov/home.jsp.

Hwang SW, Li J, Gupta R, Chien V, Martin RE. What happens to patients who leave hospital against medical advice? *CMAJ* 2003;168(4):417-420.

Ibrahim, SA, Kent Kwoh, C, Krishnan, E. "Factors Associated With Patients Who Leave Acute-Care Hospitals Against Medical Advice", *American Journal of Public Health* 97, no. 12 (December 1, 2007): pp. 2204-2208.

Laur, A. (2016). Discharge against medical advice. *Journal of law and medicine*, *23*(4), 921–924.

Lee, C. A., Cho, J. P., Choi, S. C., Kim, H. H., & Park, J. O. (2016). Patients who leave the emergency department against medical advice. Clinical and experimental emergency medicine, 3(2), 88–94. https://doi.org/10.15441/ceem.15.015

Levy, F., Mareiniss, D. P., & Iacovelli, C. (2012). The importance of a proper against-medical-advice (AMA) discharge: how signing out AMA may create significant liability protection for providers. *The Journal of emergency medicine*, *43*(3), 516–520. https://doi.org/10.1016/j.jemermed.2011.05.030

Marcoux, J., Alkutbi, M., Lamoureux, J., Feyz, M., Saluja, R., & De Guise, E. (2017). Discharge Against Medical Advice in Traumatic Brain Injury: Follow-Up and Readmission Rate. Canadian Journal of Neurological Sciences / Journal Canadien Des Sciences Neurologiques, 44(3), 311-317. doi:10.1017/cjn.2016.241.

Reese, P. (2019) As ER Wait Times Grow, More Patients Leave Against Medical Advice. Kaiser Health News: Picture of Health. May 17, 2019; retrieved from https://khn.org/news/as-er-wait-times-grow-more-patients-leave-against-medical-advice/.

Schaefer, G. R., Matus, H., Schumann, J. H., Sauter, K., Vekhter, B., Meltzer, D. O., & Arora, V. M. (2012). Financial responsibility of hospitalized patients who left against medical advice: medical urban legend?. *Journal of general internal medicine*, *27*(7), 825–830. https://doi.org/10.1007/s11606-012-1984-x

SID Database Documentation. Healthcare Cost and Utilization Project (HCUP). April 2021. Agency for Healthcare Research and Quality, Rockville, MD. www.hcup-us.ahrq.gov/db/state/siddbdocumentation.jsp.

Taqueti VR. Leaving against medical advice. *N Engl J Med.* 2007;357(3): 213-215.

Yong, TY, Fok, JS, Hakendorf, P, Ben-Tovim, D, Thompson, CH, Li, JY. Characteristics and outcomes of discharges against medical advice among hospitalised patients. Intern Med J. 2013;43:798-802.